REMARKS

Claims 1-17 are pending in the present application. The claims stand as amended in the Response To Final Office Action Under 35 U.S.C. § 116 dated August 12, 2003.

Applicants respectfully request reconsideration of the application in view of the remarks appearing below.

Rejections Under 35 U.S.C. § 102

LeCroy, Jr.

The Examiner has rejected claims 1, 3, 5, 6, 9, 10 and 15-17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,423,373 to LeCroy, Jr., stating LeCroy, Jr. discloses all the limitations of these claims. Applicants respectfully disagree.

LeCroy, Jr. discloses a dual-lead test probe for use in a system used to determine an initially unknown current *I* flowing in a circuit segment, such as a portion of an electrical lead of a circuit board. The system utilizes two probes 15, 25, a current generator 20, a voltage detector 12 and a voltmeter 32. Each probe 15, 25 includes a first conducting member 14, 16 for measuring a voltage drop between two points on the circuit segment 10 and a second conducting member 24, 26 for applying a test current *i* to the circuit segment that is opposite in direction to unknown current *I*. The voltage drop is measured by voltage detector 12, and test current *i* is driven by current generator 20. Current generator 20 includes a voltage input terminal (not shown) that receives a voltage signal from voltage detector 12 for adjusting the rate of increase of test voltage *i* as a function of the voltage drop measured between first conducting members 14, 16.

In order to determine the unknown current *I*, test probes 15, 25 are engaged with circuit segment 10 in a spaced-apart manner and so that first conducting members 14, 16 are located between second conducting members 24, 26. Initially, the voltage drop detected between first conducting members 14, 16 is equal to the product of the unknown current *I* and the unknown small resistance of circuit segment 10 between the first conducting members. As testing proceeds, current generator 20 drives an increasing test current *i* through circuit segment in a direction opposite unknown current *I*. As test current *i* increases in magnitude, the magnitude of the current flowing through circuit segment, i.e., $|I-i|$, becomes increasingly smaller. As this current becomes smaller, so does the voltage drop detected between first conducting members

14, 16 by voltage detector 12. When test current *i* is equal to unknown current *I*, the current flowing in circuit segment 10 from second conducting member 24 to second conducting member 26 is zero. At this point, voltmeter 32 is used to determine the magnitude of test current *i*, which is equal to unknown current *I*. Unknown current *I* is thus measured.

As mentioned above, the rate of change of test current *i* is controlled based on the voltage drop detected by voltage detector 12 between first conducting members 14, 16. As the detected voltage drop decreases (with increasing test current *i*), the rate of increase of the test current slows and eventually stops when no voltage drop is detected (because the test current equals unknown current *I*).

Turning now to the rejected claims, independent claim 1 requires, among other things, a forcing probe that applies an electrical signal, e.g., a voltage, at a first location on a probe pad and sensing probe that senses that electrical signal at a second location on the probe pad. Claim 1 further includes a feedback system that varies the magnitude of the electrical signal applied by the forcing probe as a function of the magnitude of the electrical signal sensed at the sensing probe. The same electrical signal is being applied, sensed and controlled.

In contrast, the LeCroy, Jr. system, at most, can be argued to apply a first electrical signal, i.e., test current *i*, and sense a second electrical signal, i.e., the voltage drop across first conducting members 14, 16, wherein the second electrical signal is different from the first electrical signal. Correspondingly, at most, it could be argued that LeCroy, Jr. discloses a feedback system that adjusts the magnitude of a first electrical signal as a function of a second, and different, electrical signal. Consequently, LeCroy, Jr. fails to disclose, or even suggest, the limitation of claim 1 of a feedback system that adjusts the magnitude of an electrical signal as a function of the same electrical signal. Therefore, the LeCroy, Jr. patent cannot anticipate independent claim 1, nor claims 3, 5 and 6 that depend therefrom.

Regarding independent claim 9, this claim requires, among other things, the step of adjusting the magnitude of an electrical signal applied to a first portion of a probe pad as a function of that electrical signal as sensed at a second portion of that probe pad. Similar to the discussion above relative to claim 1, LeCroy, Jr. does not disclose or suggest this step because, at most, LeCroy, Jr. discloses adjusting the magnitude of a first electrical signal as a function of a second, different electrical signal. In addition, claim 9 requires the step of providing an electrical signal to a probe pad. LeCroy, Jr. does not disclose applying an electrical signal to a probe pad,

but rather to circuit segments having currents (I) flowing therethrough. Therefore, the LeCroy, Jr. patent cannot anticipate independent claim 9, nor claims 10 and 15-17 that depend therefrom.

Pailthorp

The Examiner has rejected claims 1-17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,100,815 to Pailthorp, stating Pailthorp discloses all the limitations of these claims. Applicants respectfully disagree.

Pailthorp discloses a compound switching matrix for probing devices under test and interconnecting devices under test to measurement equipment. In particular, Pailthorp describes the switching matrix in the context of the laser trimming of resistors.

Applicants note that in making the present rejection, the Examiner did not particularly point out how the Pailthorp disclosure anticipates claims 1-17. Nevertheless, Applicants submit that Pailthorp's disclosure cannot anticipate independent claim 1 because Pailthorp is completely silent on any sort of feedback system that adjusts the magnitude of an electrical signal applied to a probe pad at a forcing probe as a function of that electrical signal as sensed at a sensing probe in contact with that probe pad, as required by independent claim 1.

Pailthorp provides only one example relative to an embodiment that utilizes two probes contacting a single conductive pad (labeled "18" in FIG. 8). This example is shown in FIG. 6 and is described in the accompanying text from col. 7, line 55 to col. 8, line 50. Otherwise, the other examples show only one probe per pad and certainly could not anticipate independent claim 1, which requires at least two probes per pad.

Referring to FIG. 6 of the Pailthorp patent, at resistor 12A at the top this figure two probes P109, P125 are shown contacting a first probe pad (not labeled) and two probes P133, P139 are shown contacting a second probe pad (also not labeled). In the corresponding description at col. 8, lines 11-29, Pailthorp describes the functions of these four probes. In particular, Pailthorp states that a measurement current flows from current probe P133 at the second probe pad, through resistor 12A and into current probe P125 in contact with the first probe pad. As the measurement current flows through resistor 12A, a corresponding voltage drop across resistor 12A between the first and second pads is sensed using voltage probes P109, 149 that contact corresponding respective ones of the first and second pads and are connected to a high-impedance voltage-measuring circuit. Even relative to this example that has two probes contacting a common pad, Pailthorp is completely silent on any sort of a feedback system that

adjusts the magnitude of an electrical signal applied to a probe pad at a forcing probe as a function of that electrical signal as sensed at a sensing probe in contact with that probe pad, as required by independent claim 1. Consequently, the Pailthorp patent cannot anticipate independent claim 1, nor claims 2-8 that depend therefrom.

Similarly, independent claim 9 requires, among other things, the step of adjusting the magnitude of an electrical signal applied to a first portion of a probe pad as a function of that electrical signal as sensed at a second portion of that probe pad. For reasons intimately linked to the immediately preceding discussion of the Pailthorp system relative to independent claim 1, the Pailthorp patent is completely silent on such a step. Rather, Pailthorp discloses nothing more than the steps of applying a first electrical signal, i.e., a current across a resistor (e.g., resistor 12A) via two current probes (e.g., probes P109, P125) that contact separate pads and measuring a second electrical signal, i.e., a voltage drop across that resistor via two voltage probes (e.g., P133, 139) that contact corresponding respective ones of the separate pads. There is no corresponding "adjusting" step. Consequently, the Pailthorp patent cannot anticipate independent claim 9, nor claims 10-17 that depend therefrom.

For at least the foregoing reasons, Applicants respectfully request that the Examiner withdraw the present rejections in view of the LeCroy, Jr. and Pailthorp patents.

Other Reference Cited by the Examiner

Applicants have reviewed U.S. Patent No. 5,151,651 Shibata, which the Examiner did not apply to the pending claims, and have found that Shibata fails to disclose or suggest at least: 1) a feedback system that adjusts the magnitude of an electrical signal applied to a probe pad at a forcing probe as a function of that electrical signal as sensed at a sensing probe in contact with that probe pad, as required by each of claims 1-8, and 2) a step of adjusting the magnitude of an electrical signal applied to a first portion of a probe pad as a function of that electrical signal as sensed at a second portion of that probe pad, as required by each of claims 9-17. Consequently, Applicants assert that the Shibata patent cannot render any of claims 1-17 unpatentable, either alone or in combination with one or more references of record and/or ordinary skill in the art.

CONCLUSION

In view of the foregoing, Applicants submit that claims 1-17 are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance is respectfully solicited. If any issues remain, the Examiner is encouraged to call the undersigned attorney at the number listed below.

Respectfully submitted,

INTERNATIONAL BUSINESS MACHINES CORP.

By: _____

Morgan S. Heller II
Registration No.: 44,756
DOWNS RACHLIN MARTIN PLLC
Tel: (802) 863-2375

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